

## 1 ABSTRACT

5 The present invention relates to a systematic process for the creation of functionally organized, spatially patterned assemblies polymer-microparticle composites including the AC electric field-mediated assembly of patterned, self supporting organic (polymeric) films and organic (polymeric) - microparticle composite films of tailored composition and morphology; the present invention further relates to the incorporation of said assemblies into other structures. The present invention. also relates to the application of such functional assemblies in materials science and biology. Additional areas of application include sensors, catalysts, membranes, micro-reactors, smart materials. Miniaturized format for generation of multifunctional thin films. Provides a simple set-up to synthesize thin films of tailored composition and morphology: